

CLAIMS:

What is claimed is:

1. A method for the fabrication of a Schottky barrier diode on a SiC wafer, comprising the steps of:
- placing a mask having a window on a surface of the SiC wafer;
 - depositing conductive material on the mask and exposed portions of the wafer surface;
 - stripping off the mask so as to leave the conductive material deposited upon portions of the wafer surface; and
 - implanting an edge termination layer to the wafer beneath the surface thereof but not beneath the conductive material.
2. The method for the fabrication of a Schottky barrier diode on a SiC wafer as described in claim 1, further comprising the steps of:
- before placing the mask, forming an insulating layer on the surface of the wafer;
 - applying the mask to the insulating layer; and
 - etching away a portion of the insulating layer that is within the window to expose the SiC wafer therebeneath before depositing the conductive material.

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3. The method for the fabrication of a Schottky barrier diode as described in claim 2, wherein the step of forming an insulating layer comprises forming an oxide layer.
4. The method for the fabrication of a Schottky barrier diode as described in claim 3, wherein the step of implanting an edge termination layer comprises implanting inert ions.
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5. The method for the fabrication of a Schottky barrier diode as described in claim 4, wherein the inert ion comprises argon ions.
6. The method for the fabrication of a Schottky barrier diode as described in claim 2, further comprising the step of applying a treatment to the exposed portion of the SiC wafer surface.
7. The method for the fabrication of a Schottky barrier diode as described in claim 1, further comprising the step of depositing a passivation layer over the conductive material and the wafer and removing portions of the passivation layer that cover the conductive material.
8. The method for the fabrication of a Schottky barrier diode as described in claim 1 wherein the conductive material is a metal.

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9. A Schottky barrier diode, comprising:
- (a) a SiC wafer having a first surface;
 - (b) a conductive layer formed on a portion of the first surface;
and
 - (c) an edge termination layer implanted in the wafer so as to reside beneath a portion of the first surface that is not beneath the conductive layer.
10. The Schottky barrier diode as described in claim 9, further comprising an insulating layer formed on portions of the first surface not under the conductive layer.
11. The Schottky barrier diode as described in claim 10, wherein the insulating layer is a low temperature oxide.
12. The Schottky barrier diode as described in claim 10, wherein the insulating layer is a thermally grown oxide.
13. The Schottky barrier diode as described in claim 11, wherein the low temperature oxide is silicon dioxide.
14. The Schottky barrier diode as described in claim 13 wherein the thermally grown oxide is silicon dioxide.

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SILICON CARBIDE SCHOTTKY BARRIER
DIODE AND METHOD OF MAKING

15. The Schottky barrier diode as described in claim 9, wherein the conductive layer is formed of a metal.
16. The Schottky barrier diode as described in claim 15, wherein the metal is titanium.
17. The Schottky barrier diode as described in claim 9, wherein the conductive layer has a thickness greater than a thickness of the insulating layer.

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